

OYSTER INVESTIGATIONS: BACKGROUND, JUSTIFICATION AND OBJECTIVES

List of Projects

1. Preparation of the book on oyster biology based on studies of structure, functions and requirements of the American oyster Crassostrea virginica.
2. Productivity and methods of cultivation of oysters in the waters of the Cape Cod area.
3. Control of whelks, drills, and other predators of oysters in Cape Cod waters.

OYSTER INVESTIGATIONS: BACKGROUND, JUSTIFICATION AND OBJECTIVES

Sound knowledge of the biology, physiology and ecology of mollusks is the basis for successful management and development of shellfishery resources of the country. The need for such information regarding the oyster is particularly urgent because of the general decline in oyster production, widespread and unexplained mortalities of oysters in the Middle Atlantic and Northern States, depletion of oyster grounds by starfish and other predators and overfishing of public oyster bottoms. No handbook of this type is available in any language. The present knowledge of oyster biology is being summarized in a comprehensive book which is based on critical examination of the world literature and on original research conducted at Woods Hole Laboratory and in the field.

The oyster investigations consist of the following three projects:

1. Preparation of the book on oyster biology based on studies of structure, functions and requirements of the American oyster, Crassostrea virginica.
2. Productivity and method of cultivation of oysters in the waters of Cape Cod area.
3. Control of whelks, drills and other predators of oysters in Cape Cod waters.

SUMMARY OF SCHEDULE

Investigation: Oyster

Biological Laboratory: Woods Hole, Mass.

[illegible]

*Total needed by Laboratory for Project in thousands of dollars.

65/6/2 7TL#

Location Woods Hole, Mass.
Branch Woods Hole
Date June 26, 1959
File No. _____

Research Project Outline

Title of Project: Preparation of the book on oyster biology based on studies of
structure, functions and requirements of the American oyster,

Investigation Title: Crassostrea virginica. Oyster Investigations

Investigation Chief: Paul S. Galtsoff

Project Leaders: Paul S. Galtsoff Fishery Research Biologist GS-13
Name Title Grade

Assistants: (Title and Grade)

Ruth L. Von Arn, Illustrator, GS-9 WAE employee

(Part-time) William M. Shaw, GS-7

Collaborators:

Need for Information: Information regarding oyster biology and ecology is needed

because of the general decline in oyster production, widespread and
unexplained mortalities of oysters in the Middle Atlantic and Northern States,
depletion of oyster grounds by starfish and other predators and overfishing
of public oyster bottoms. No handbook of this type is available in any
language.

Objective: The objective of the proposed book is to present the needed
information on oysters for the use of conservation officers, oyster growers, Public
Health officers, and biologists engaged in oyster research.

Method of Procedure:

Phase 1: Preparation of detailed oyster bibliography. The work completed except for
the addition of current items. The bibliography comprises several thousand subject
and author cards of publications in English and eight foreign languages.

Phase 2: Laboratory studies of anatomy, histology, ultrastructure (electron microscopy)
and physiology. All this work has been completed except the study of oyster
development. Preparation of illustrations for the text (about 200 were made, 50
remain to be done.)

Phase 3: Writing of the text. Nine chapters are finished and ready for review by the
Editor.

6-12-59 Phase 4: Corrections and changes suggested by the Editorial office, preparation
of an index. The entire book including phase 4 is expected to be finished in 1961.

Phase 3:

FY <u>1959</u>	FY <u>1960</u>	FY <u>1961</u>
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Recommended Source of Funds _____
(S-K, Regular, Contributed, etc.)

Recommended by: _____ Date: _____
 Originator _____

Investigation Chief Paul S. Galtsoff

Laboratory Director Herbert W. Graham

Regional Director

Branch Chief

Approved by: _____
Division Chief for Director

Remarks

(Continue on reverse side)

U. S. Fish and Wildlife Service
Bureau of Commercial Fisheries

19-2

Location Woods Hole, Mass.
Branch Marine Fisheries
Date: June 26, 1959
File No. _____

Research Project Outline

Title of Project: Productivity and methods of cultivation of oysters in the waters of the Cape Cod area.

Investigation Title: Oyster Investigations

Investigation Chief: Paul S. Galtsoff

Project Leaders:	<u>William H. Shaw</u>	<u>Fishery Research Biologist</u>	<u>GS-7</u>
	Name	Title	Grade

Assistants: (Title and Grade)

Collaborators: Shellfish wardens of Chatham and Wareham; oyster growers of the Chatham area.

Need for Information: The advantages of raft culture as a method of developing latent oyster resources in the Cape area has been demonstrated by previous observations. Oysters kept above the bottom grow at a faster rate than those on the bottom but the ecological factors affecting their growth are not known.

Objective: Principal ecological factors affecting reproduction and growth will be studied in order to determine potential productivity of oyster bottoms and devise practical methods of their utilization.

Method of Procedure:

Phase 1: Growth and mortality of oysters kept at different elevations above bottom is measured at regular intervals. Two localities have been selected for comparative study; depending on facilities and personnel three places may be added for these studies. Initial observations in Oyster River show that this method of culture gives satisfactory results.

Phase 2: Principal ecological factors such as temperature, chemical composition of water and plankton content of tidal ponds and rivers of Cape Cod will be studied for the purpose of determining their effect on productivity. Additional factors such as water movements, rate of flushing of estuaries etc. may be

8-12-59 studied if personnel and funds are available.

Phase 3: Application of modern technique of seed production by various types of collectors will be studied with reference to their suitability to local conditions.

Phase 4: Tabulation and analysis of data. Preparation of report for publication.

Method of Procedure: (Cont'd)

Phase 3:

Estimated Costs: Total Needed by Laboratory for Complete Project			<u>27.5</u>
	FY <u>1959</u>	FY <u>1960</u>	FY <u>1961</u>
Personal Services	<u>3.5</u>	<u>4.9</u>	<u>8.5</u>
Other Expenses:			
Within Project	<u>0.4</u>	<u>0.5</u>	<u>1.6</u>
	<u>---</u>	<u>---</u>	<u>---</u>
Lab. Adm. & Ser.	<u>---</u>	<u>---</u>	<u>---</u>
Lab. Total	<u>3.9</u>	<u>5.4</u>	<u>10.1</u>
Regional Office	<u> </u>	<u> </u>	<u> </u>
Washington Office	<u> </u>	<u> </u>	<u> </u>
Total	<u> </u>	<u> </u>	<u> </u>

Recommended Source of Funds

(S-K, Regular, Contributed, etc.)

Estimated Date of Completion: Phase 1 FY ; Phase 2 FY ; Phase 3 FY ; Project FY 61

Recommended by:

Date

Originator

Investigation Chief Paul S. GaltsoffLaboratory Director Herbert W. Graham

Regional Director

Branch Chief

Approved by:

Division Chief for Director

Remarks

(Continue on reverse side)

U. S. Fish and Wildlife Service
Bureau of Commercial Fisheries

19-3

Location Woods Hole, Mass.
Branch Marine Fisheries
Date: June 25, 1959
File No. _____

Research Project Outline

Title of Project: Control of whelks, drills, and other predators of oysters
in Cape Cod waters.

Investigation Title: Oyster Investigations

Investigation Chief: Paul S. Galtsoff

Project Leader: William N. Shaw Fishery Research Biologist GS-7
Name Title Grade

Assistants: (Title and Grade)

Collaborators: Shellfish wardens of Chatham and Wareham; oyster growers
of the Chatham area.

Need for Information: Cultivation of oysters in Cape Cod waters has been a
failure because of predation by whelks, drills, and other invertebrates. By using
wooden traps the majority of the channelled whelks can be removed from the oyster
bottoms. There is a need of improving the methods of control of this and other
species, particularly the knobbed whelks, drills and flat worms.

Objective: To develop practical methods of controlling predators suitable to
local conditions.

Method of Procedure:

Phase 1: Behavior of whelks and other enemies will be studied in order to
improve the technique of using traps and other means of controlling these
pests. Traps for catching channelled whelks proved to be efficient but
information is needed concerning the time, location and manner in which
they should be used for effective results.

Phase 2: The use of mechanical and chemical barriers in preventing the
infestation of oyster grounds will be studied in the areas where
experimental rafts are anchored.

Phase 3: Tabulation and analysis of data. Preparation of report for
publication.

Oysters 3 Sheet No. 2
Method of Procedure: (Cont'd)
Phase 3:

File No.:

Estimated Costs:	Total Needed by Laboratory for Complete Project	12.1	
	FY <u>1959</u>	FY <u>1960</u>	FY <u>1961</u>
Personal Services	2.0	1.9	4.0
Other Expenses:			
Within Project	0.4	0.4	1.6
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Lab. Adm. & Ser.	---	---	---
Lab. Total	2.4	2.3	5.6
Regional Office			
Washington Office			
Total			

Recommended Source of Funds _____
(S-K, Regular, Contributed, etc.)

Estimated Date of Completion: Phase 1 FY ; Phase 2 FY ; Phase 3 FY ; Project FY 61

Recommended by: _____ Date _____
Originator _____
Investigation Chief Paul S. Galtsoff
Laboratory Director Herbert W. Graham
Regional Director _____
Branch Chief _____
Approved by: _____
Division Chief for Director _____

Remarks

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